

REMARKS

A. Objection to Abstract of the Disclosure

In the Office Action of April 25, 2006, the Abstract of the Disclosure was objected to for containing sentence fragments. The Abstract of the Disclosure has been amended so that there are no sentence fragments. Accordingly, the objection is overcome and should be withdrawn.

B. 35 U.S.C. § 112, Second Paragraph

Claim 17 was rejected under 35 U.S.C. § 112, second paragraph for being indefinite in meaning. Claim 17 has been amended so as to use language similar to that of claim 7. Since claim 7 has been deemed clear in meaning, claim 17 should be deemed clear in meaning. Accordingly, the rejection has been overcome and should be withdrawn.

C. 35 U.S.C. § 102

1. Claims 1, 8, 12, 18 and 19

Claims 1, 8, 12, 18 and 19 were rejected under 35 U.S.C. § 102(b) as being anticipated by Mayer et al. Applicant traverses the rejection. The Office Action has relied on the following passage of Mayer et al. as showing a scanning signal modified by a reference marker:

In a preferred embodiment, the reference marker R is embodied as amplitude structures B1 to B5 on the scale 2 and is scanned by cast shadows. Scanning a cast shadow corresponds to a purely geometric representation without taking the diffraction of light into consideration. In the course of scanning a cast shadow, the grating to be represented is arranged so close to the plane of projections that diffraction at this distance is negligible and has no effect. The illumination of the phase grating T and of the reference marker R is mutually provided by the divergent light source 4. The width DB of a field B1 to B5 of the reference marker R corresponds preferably to the graduation period P2 or a multiple of the graduation period P2 of the phase grating T, i.e., it is greater than the width DT of a gap in the phase grating T. (paragraph [0032]).

The above passage only refers to generating an absolute position signal from reference

marker R. The passage is silent that a scanning signal is modified by a reference marker.

Accordingly, claim 1 is not anticipated by Mayer et al.

Despite the impropriety of the rejection, claim 1 has been amended to clarify that at least one periodic scanning signal is modified locally by a reference marking and is associated with one of the detector elements positioned over at least a length of a measurement range. A first absolute position is determined from the scanning signals and a second absolute position is determined from the at least one modified periodic scanning signal, wherein the at least one modified scanning signal “defines one specific location of said one of said detector elements.” Meyer et al. does not disclose the determination of two absolute positions in the manner recited in claim 1, as amended. The Office Action has relied on photodetectors 5, 6 and 7 as generating the recited periodic scanning signals. The Office Action at page 4 has also defined a measurement range R in FIG. 3 of Mayer et al. that corresponds to the recited measurement range R. However, nowhere does Mayer et al. disclose determining a second absolute position from at least one modified periodic scanning signal, wherein the at least one modified scanning signal “defines one specific location of said one of said detector elements.” Paragraph 0043 of Mayer et al. relied on by the Office Action does not disclose or suggest the determination of two absolute positions in the manner recited in claim 1. Instead, Mayer et al.’s detectors 5, 6 are the only detectors that generate periodic signals and incremental position measurements. The periodic signals of detectors 5, 6 are not used for any other purpose.

The signal from detector 7 is exclusively used for forming a single reference marking signal when the fields B1 to B5 agree with the fields A1 to A3. The reference marking signal is not used for generating an absolute position and is also not used for generating modified signal from several signals since only one signal is generated.

In summary, Mayer et al. does not disclose or suggest determining two absolute positions in the manner recited in claim 1. Accordingly, the rejection should be withdrawn.

Besides not being anticipated by Mayer et al., claim 1 is not rendered obvious by Mayer et al. In particular, there is no motivation in Mayer et al. or the prior art to alter Mayer et al. to either 1) have a scanning signal modified by a reference marker or 2) determining a second absolute position from at least one modified periodic scanning signal, wherein the at least one modified scanning signal “defines one specific location of said one of said detector elements.” Without such motivation, claim 1 should be deemed patentable over Mayer et al.

Regarding claim 18, it recites that “each one of said detector elements is assigned to its own corresponding location within said length of said measurement range and said second absolute position of said reference marking determined by said evaluation device is one of said corresponding locations of said detector elements within said length of said measurement range.” Thus, for example, a first detector is assigned a location x_1 and a second detector is assigned a second location x_2 . The claim further recites that the second absolute position determined is one of the corresponding locations of the detector elements. It is noted that the Office Action relies on the photodetectors 5, 6 as disclosing the recited detector elements. There is no disclosure that the absolute position corresponds to one of the positions of photodetectors 5, 6 and 7. Mayer et al. discloses that within the measurement range R defined on page 4 of the Office Action the marking R is only scanned by detector 7. Accordingly, a position within R cannot be determined. Furthermore, paragraph 0042 of Mayer et al. clearly demonstrates that only one reference position can be determined during the scanning of marking R because of the spatial distribution of the fields B1 to B5, i.e., within the length of the measuring range defined by the Office Action. Thus, the rejection of claim 18 should be withdrawn.

2. Claims 12 and 19

Claims 12 and 19 were rejected under 35 U.S.C. § 102(e) as being anticipated by Mayer et al. Applicant traverses the rejection. In particular, claim 12 recites “at least one of said plurality of periodic signals is locally modified by said reference marking and is associated with one of said detector elements.” As pointed out above in Section C.1, Mayer et al. does not disclose or suggest such a modification of periodic signals by a reference marking. Accordingly, the rejection is improper and should be withdrawn.

Despite the impropriety of the rejection, claim 12 has been amended to clarify that a second absolute position is determined “while said at least one scanning signal modified by said reference marking defines one specific location of said one of said detector elements.” As explained above in Section C.1, Mayer et al. does not disclose the determination of a second absolute position in the manner recited in claim 12. Accordingly, claim 12 is not anticipated by Mayer et al. and so the rejection should be withdrawn.

Besides not being anticipated by Mayer et al., claim 12 is not rendered obvious by Mayer et al. since there is no suggestion in Mayer et al. or the prior art to alter Mayer et al. to either 1) modify periodic signals by a reference marking or 2) determine a second absolute position “while said at least one scanning signal modified by said reference marking defines one specific location of said one of said detector elements.” Without such suggestion, claim 12 should be deemed patentable over Mayer et al.

Regarding claim 19, it recites that “each one of said detector elements is assigned to its own corresponding location within said length of said measurement range and said second absolute position of said reference marking determined by said evaluation device is one of said corresponding locations of said detector elements within said length of said

measurement range.” For reasons similar to those given above in Section C.1 with respect to claim 18, the rejection should be withdrawn.

D. 35 U.S.C. § 103

1. Mayer et al. and Omi

a. Claims 2-4

Claims 2-4 were rejected under 35 U.S.C § 103 as being obvious in view of Mayer et al. and Omi. Claims 2-4 depend directly or indirectly on claim 1. As pointed out in Section C.1, there is no motivation in Mayer et al. or the prior art to alter Mayer et al. to either 1) have a scanning signal modified by a reference marker or 2) determining a second absolute position from at least one modified periodic scanning signal, wherein the at least one modified scanning signal “defines one specific location of said one of said detector elements.” Omi discloses using a detection pattern 13 that is scanned by an array 52, wherein the array 52 is separate from the array 51 used to scan the grating 12. Accordingly, Omi does not use a reference marker to generate two absolute positions in the manner recited in claim 1. Since Omi also does not suggest altering Mayer et al. to either 1) have a scanning signal modified by a reference marker or 2) determining a second absolute position from at least one modified periodic scanning signal, wherein the at least one modified scanning signal “defines one specific location of said one of said detector elements”, the rejection should be withdrawn.

b. Claims 13-15 and 17

Claims 13-15 and 17 were rejected under 35 U.S.C § 103 as being obvious in view of Mayer and Omi. Claims 13-15 and 17 depend directly or indirectly on claim 12. As pointed out in Section C.2, there is no motivation in Mayer et al. or the prior art to alter Mayer et al. As pointed out in Section C.2, there is no motivation in Mayer et al. to alter Mayer et al. to either 1)

modify periodic signals by a reference marking or 2) determine a second absolute position “while said at least one scanning signal modified by said reference marking defines one specific location of said one of said detector elements.” For reasons similar to those given above in Section D.1.a, Omi also does not suggest altering Mayer et al. to either 1) modify periodic signals by a reference marking or 2) determine a second absolute position “while said at least one scanning signal modified by said reference marking defines one specific location of said one of said detector elements.” Accordingly, the rejection should be withdrawn.

2. Mayer et al.

Claim 9 was rejected under 35 U.S.C § 103 as being obvious in view of Mayer et al. Claim 9 depends directly on claim 1. As pointed out in Section C.1, there is no motivation in Mayer et al. or the prior art to alter Mayer et al. to either 1) have a scanning signal modified by a reference marker or 2) determining a second absolute position from at least one modified periodic scanning signal, wherein the at least one modified scanning signal “defines one specific location of said one of said detector elements.” Accordingly, the rejection should be withdrawn.

3. Mayer et al. and Holzapfel et al.

Claims 10 and 11 were rejected under 35 U.S.C § 103 as being obvious in view of Mayer et al. and Holzapfel et al. Claims 10 and 11 depend directly or indirectly on claim 1. As pointed out in Section C.1, there is no motivation in Mayer et al. or the prior art to alter Mayer et al. to either 1) have a scanning signal modified by a reference marker or 2) determining a second absolute position from at least one modified periodic scanning signal, wherein the at least one modified scanning signal “defines one specific location of said one of said detector elements.” Since Holzapfel et al. also does not suggest altering Mayer et al. to either 1) have a scanning signal modified by a reference marker or 2) determining a second absolute position from at least

one modified periodic scanning signal, wherein the at least one modified scanning signal “defines one specific location of said one of said detector elements”, the rejection should be withdrawn.

E. Claims 5-7 and 16

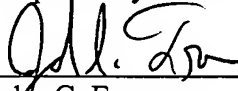
Applicant notes with appreciation that claims 5-7 and 16 have been deemed to contain allowable subject matter.

It is noted that the Office Action provides reasons for the allowance of claims 5-7 and 16. Applicant traverses the reasons to the extent that there are broader and other reasons why the claims are allowable.

CONCLUSION

In view of the arguments above, Applicant respectfully submits that all of the pending claims 1-19 are in condition for allowance and seek an early allowance thereof. If for any reason, the Examiner is unable to allow the application in the next Office Action and believes that an interview would be helpful to resolve any remaining issues, she is respectfully requested to contact the undersigned attorneys at (312) 321-4200.

Respectfully submitted,



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